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- d) attaching said mechanical fastener to said absorbent article in the target area with said slow-crystallizing hot melt adhesive under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about 60 min/1.2 kg.
2. (Amended) The method according to claim 1 wherein said mechanical fastener/absorbent article bond static shear strength is at least about 240 min/1.2 kg.
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8. (Amended) An absorbent article comprising:
- a11
- a) a liquid pervious topsheet;
 - b) a liquid impervious backsheet joined to said topsheet;
 - c) an absorbent core positioned between said topsheet and said backsheet; and
 - d) at least one mechanical fastener positioned so as to secure the absorbent article to an intended user, wherein the mechanical fastener is attached to said absorbent article using a slow-crystallizing hot melt adhesive under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about 60 min/1.2kg.
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IN THE DRAWINGS:

Figure 2 has been amended according to the amended Figure 2 provided in Appendix C, shown with proposed changes in red pursuant to 37 C.F.R. § 1.121(d).

REMARKS

Claims 1-10 are pending in the application. Claims 1-7 stand rejected under 35 U.S.C. § 112, 2nd Paragraph. Claims 1-10 stand rejected under 35 U.S.C. § 103(a). By this Amendment, claims 1, 2 and 8 are amended. Applicant respectfully requests entry of the amendments and reconsideration and allowance of pending claims 1-10 in view of the following remarks.

Amendments to the Drawings, Specification and Claims

The specification has been amended correct informalities noted by the Examiner in paragraphs 1, 2 and 3 of the Office Action, and to correct minor typographical and grammatical errors.

The Examiner objected to the drawings "because in Figure 2 the line from 28 should be dashed to denote underlying structure. Also, numerals 44 & 46 denote the same structure and the structure of tabs 31 and 36 are denoted inconsistently from one another." The Examiner's objection is somewhat vague because numeral 31 is not present on Figure 2. However, based on the context of the objection, Applicant believes that the Examiner intended to refer to numeral 34, rather than numeral 31. In response to the Examiner's objections, Applicant submits an amendment to Figure 2, which corrects the noted discrepancies. If Applicant's understanding of the Examiner's objection is incorrect, Applicant respectfully requests clarification.

In response to the Examiner's objection to Figure 2, the line from numeral 28 was changed from a solid line to a dashed line, to indicate that it refers to an underlying structure. The lines from numerals 40 and 46 on the right side of the drawing were corrected to properly indicate portions of mechanical fastener 34, and now mirror similar structures indicated by numerals 40 and 46 on the left side of the drawing (referring to mechanical fastener 36). In addition, a dashed line was added to Figure 2 to delineate between the ear tab 38 and the elastomer substrate 40. Support for these amendments are found in Figure 2, particularly with reference to the analogous structures depicted in the same drawing.

The Applicant also has amended the specification and claims 1, 2 and 8 to conform the specification and claims to the unit of measure for static shear strength provided in the specification at Table 1. Specifically, the static shear strength results shown in Table 1 use two formats: "min/kg" and "min/1.2kg." The claims and specification have been converted to the "min/1.2kg" unit of measure to properly

reflect the test method condition that was used to generate these results. Support for this amendment is found in Table 1.

The 35 U.S.C. § 112 Rejections

Claims 1-7 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. Regarding claim 1, the Examiner specifically asks: "Are the adhesive in step (c) and that in step (a) one and the same?" Upon review of the claim, Applicant believes that the Examiner intended to refer to steps (c) and (d), as it is these steps that refer to the adhesive. If Applicant's understanding of the rejection is in error, further clarification from the Examiner is respectfully requested. The § 112 rejection is respectfully traversed for the following reasons.

In claim 1, the adhesive in step (d) is the same as that recited in step (c). Support for this understanding is found in the specification at page 4, lines 16-20. As such, Applicant has amended claim 1, step (d) to read "said slow-crystallizing adhesive," to indicate that antecedent basis for the adhesive in step (d) is found in step (c).

Applicant respectfully submits that the claims fully comply with 35 U.S.C. § 112, 2nd Paragraph. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the rejection of claims 1-7 under 35 U.S.C. § 112.

The 35 U.S.C. § 103 Rejections

The Examiner rejected Claims 1-10 under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 5,853,864 to Bunnelle ("Bunelle") in view of United States Patent No. 5,961,761 to Heindel, et al. ("Heindel"). The Examiner addresses two claimed aspects of the present invention in detail: (1) the combination of a mechanical fastener and the remainder of the garment, and (2) the specific bond static shear

strength. Applicant respectfully traverses this rejection and requests reconsideration in light of the following remarks.

The References Are not Properly Combined to Render Obvious the Attachment of a Fastener to A Garment Using Slow-Crystallizing Hot Melt Adhesives

Bunelle is directed towards reducing moisture-induced debonding of certain parts of absorbent articles. In order to achieve this objective, Bunnelle teaches the use of a slow-crystallizing hot melt adhesive for assembling the parts of absorbent articles that are subject to moisture-induced debonding. See Bunnelle, col. 3, lines 21-30, and col. 4, lines 28-34. Moisture-induced debonding typically occurs in garment structures that are exposed to moisture or moisture vapor during normal use. In an absorbent article such as a diaper, these components typically include the inner lining, the absorbent core and components thereof, and other components that are located towards the center of the article where moisture strikes and flows within the article. Moisture-induced debonding is not a problem outside the garment's outer cover, which provides a liquid barrier that contains bodily fluids within the article. As such, portions of the article that are located on the outer surface of the outer cover, or along the distant side edges of the cover (e.g. fastener elements) are not exposed to moisture during use and are not exposed to any threat of moisture-induced debonding.

Bunnelle teaches that a slow-crystallizing adhesive may be used to bond various parts of the absorbent article. Specifically, Bunnelle states that the "adhesive compositions of the invention can be used to form bonds": (1) "between apertured films and nonapertured films"; (2) "between tissue and nonwoven or woven fabric layers"; (3) "between absorbent fluff and tissue overwraps"; and (4) "between elastic bands or elements and any structural component of the absorbent diaper." Bunnelle, col. 10, lines 28-34. See also col. 8, line 55 - col. 10, line 5. Notably, every one of the bonds that Bunnelle describes is a bond between *non-load-bearing members*; meaning that during normal use these bonds do not directly support the weight of the diaper.

In contrast to the various garment parts described in Bunnelle, fastener members are *load-bearing* members. Load-bearing members are those that directly support the weight of the diaper and any contents thereof. Load-bearing members also must be able to resist the significant pre-loading tension exerted on the garment while fastening the garment to a wearer. In a typical absorbent garment, the fastener tabs are the primary load bearing members, and the importance of providing a strong and suitable bond between fastener tabs and the garment is highlighted by the fact that the fastener tabs typically have a relatively small surface area available for connection to the garment.

The difference between load-bearing members and non-load-bearing members is significant. In light of the difference between load-bearing members and non-load-bearing members, those of ordinary skill in the art generally recognize that materials and bonds for load-bearing members need to be considerably stronger than materials and bonds for non-load bearing members. It is also well understood that adhesives used in non-load-bearing applications are not necessarily suitable for load-bearing applications. The fact that Bunnelle discloses many non-load-bearing uses for slow-crystallizing hot melt adhesives, but utterly fails to mention any load-bearing uses, demonstrates that Bunnelle did not recognize that slow-crystallizing adhesives could be formulated to provide the required strength and durability to be used with load-bearing members.

As the Examiner has pointed out, Bunnelle fails to explicitly teach the use of a slow-crystallizing hot melt adhesive to attach a fastener tab to a garment. Furthermore, Bunnelle fails to implicitly teach or suggest that slow-crystallizing hot melt adhesive may be used to attach fastener tabs for at least two reasons. First, the entire focus of Bunnelle is to address the problem of moisture-induced debonding, a problem that fastener tabs do not experience. Second, Bunnelle is limited to teaching adhesives for non-load-bearing bonds, and fails to suggest any use for load-bearing bonds, such as

fastener tabs. In brief, a person of ordinary skill in the art would find little or no reason to reach for the teaching of Bunnelle when addressing the issue of bonding fastener tabs to absorbent articles.

The Examiner attempts to cure Bunnelle's deficiency by combining it with Heindel. Heindel teaches the construction of mechanical fastener tabs using hot melt adhesives. While the focus of Heindel is directed towards a process to protect the stem-like projections of hook materials (which is unrelated to the bond between the fastener tab and the garment), Heindel also briefly mentions that "[a]ny method capable of joining different materials together is believed suitable for use in the present invention. For example, the base material of the hook material 50 may be attached to the substrate web by hot... melt adhesives." Heindel, col. 7, lines 56-60.

Although Heindel's offhand reference to the use of hot melt adhesives appears to suggest that *any* hot melt adhesive is suitable for this bond, this is not how one of ordinary skill in the art would understand Heindel. It is well understood by those of ordinary skill in the art that various hot melt adhesives have different properties and features. For proof of this, one need look no further than the Bunnelle reference, which distinguishes one subset of hot melt adhesives from the others based on their ability to resist moisture-induced debonding. For the same reasons, it is understood that some hot melt adhesives are strong enough to bond fastener tabs to garments, and other hot melt adhesives are not strong enough to provide such a bond. Indeed, only a fraction of the hot melt adhesives manufactured today would be suitable for providing the necessary high load strength required for the bond between fastener tabs and garments. In light of this common knowledge, Heindel must be understood to teach that the base material of the hook material may be attached to the substrate by any hot melt adhesive *that has a suitable bond strength for such an application.*

References are not properly combined in a 35 U.S.C. § 103 rejection if there is no motivation to combine the references provided in the references themselves. *See* M.P.E.P. § 2143.01. The Examiner alleges that Bunnelle teaches the application of a slow crystallizing adhesive in an absorbent article, under the same conditions as set forth in the claims of the present invention, and alleges that Heindel teaches that hot melt adhesives may be used to join fasteners to absorbent garments. As motivation to combine the references, the Examiner alleges that:

To employ a mechanical fastener as taught by Heindel et al as a component of the Bunnelle article and attached by the adhesive and method thereof would be obvious to one of ordinary skill in the art in view of the recognition that such is a component of a disposable article attached to the remainder thereof by a hot melt adhesive and the desirability of Bunnelle to attach disposable article components by a hot melt adhesive.

Office Action, page 4. The Applicant respectfully disagrees and asks the Examiner to reconsider this combination.

When the references are properly understood, as described above, it is clear that there is no suggestion in either reference to combine the teachings of the two references. Although Bunnelle suggest various non-load-bearing uses for a slow-crystallizing hot melt adhesive, Bunnelle fails to provide any examples in which the adhesive is being used in a load-bearing capacity. Indeed, the teachings of Bunnelle concern preventing moisture-induced debonding, not providing a high-strength bond suited for attaching fasteners to garments. As such, Bunnelle does not suggest that its teachings should be combined with Heindel (or any other reference) for the purpose of attaching fastener tabs to absorbent articles.

Furthermore, although Heindel broadly states that fasteners may be attached using hot melt adhesives, this can only be properly understood as including the caveat that the hot melt adhesives must be able to provide a desirable bond strength.

Therefore, to the extent that Heindel may suggest some combination with references that use hot melt adhesives, this motivation to combine is limited to only those hot melt adhesives that provided suitable strength to join fastener tabs to garments. And Heindel fails to make any suggestion that the slow-crystallizing hot melt adhesives described in Bunnelle would be able to provide the desirable bond strength, and therefore fails to provide a motivation to combine with Bunnelle.

Applicants also respectfully submit that there is also no reasonable expectation of success if the two technologies are combined, making the combination improper. *See* M.P.E.P. § 2143.02. On one hand, Bunnelle teaches that slow-crystallizing hot melt adhesives may be used in non-load-bearing applications to inhibit moisture-induced debonding, while on the other hand, Heindel teaches that hot melt adhesives of sufficient strength may be used to bond fastener tabs to garments. When considering these two references, a person of ordinary skill in the art would not have any reason to think that the adhesives of Bunnelle could be successfully used to attach a fastener to a garment because fastener tabs do not suffer from moisture-induced debonding and Bunnelle fails to disclose load-bearing uses. In fact, because the strength requirements of load-bearing bonds sets them apart from non-load-bearing bonds, one of ordinary skill in the art would take special note of the fact that Bunnelle utterly fails to suggest any load-bearing uses, and would turn this reference away in favor of other references that did teach adhesives having suitable bond strength. Furthermore, to the extent that Heindel suggests that hot melt adhesives may be used to join fastener tabs and garments, Heindel still fails to suggest that the slow-crystallizing hot melt adhesives of Bunnelle are strong enough for the high loads demanded by fasteners, and therefore one of ordinary skill in the art would not perceive any reasonable expectation that Bunnelle's adhesive could be successfully applied to Heindel to make the desired load-bearing attachment.

The References Fail to Disclose the Claimed Bond Static Shear Strengths

The Examiner also alleges that the combined references also disclose the claimed bond static shear strengths. In support of this allegation, the Examiner states that "since the prior art combination teaches attaching a mechanical fastener to the absorbent article in a target area with slow crystallizing hot melt adhesive under the same conditions as disclosed such would necessarily and inevitably result in a bond static shear strength as claimed." Office Action, page 4. Applicants respectfully submit that even if the prior art combination proposed by the Examiner is proper, the combined references still fail to teach or suggest the claimed bond static shear strengths. And the Examiner's reconsideration of this matter is respectfully requested for the following reasons.

Bunnelle suggests that the benefit the crystallizing hot melt adhesive provides to a finished product is its superior resistance to moisture-induced debonding. This is measured by comparing the wet and dry strength of adhesive bonds. Specifically, Bunnelle discloses the use of a dynamic peel test, which measures the amount of force it takes to peel two bonded substrates apart. *See* Bunnelle, col.15, line 53 - col. 16, line 40. In the ideal formulation, this bond strength is sufficient to keep the two substrates joined when exposed to normal stress, and does not change when a bond is subjected to moisture.

It is commonly understood by those of ordinary skill in the art that bonds between various absorbent article components may be tested and evaluated using many different testing techniques. For example, the dynamic peel strength test used by Bunnelle is just one of many tests that could be used to characterize the strength of an adhesive bond. In addition to using measurements of dynamic peel strength, one could characterize a bond strength by its performance in a dynamic shear test, which evaluates the amount of force it takes to *shear* two bonded substrates apart, rather than *peel* them apart. In addition, rather than determining the maximum load that a bond can withstand, it is sometimes desirable to determine the amount of *time* that a bond

can withstand an constant load (called a static peel or a static shear test). For a given adhesive, results of any of these tests are not necessarily correlated, and one can not use data from one type of test to predict the results of other types of tests. For instance an adhesive could desirably exhibit a relatively low peel strength, but have a higher shear strength (e.g. Post-It® note adhesives, typical carton-sealing adhesives and so on).

In fact, adhesive manufacturers can formulate adhesives to meet any number of designated needs specified by the end user. Likewise, slow-crystallizing adhesives may be formulated to have various different properties, and the fact that a slow-crystallizing hot melt adhesive, such as the one described Bunnelle, may provide certain dynamic peel strength test results does not indicate how those same formulations will fare in a static sheer strength test. In fact, Bunnelle provides no data to suggest that the slow-crystallizing hot melt adhesives preferred for its application of resisting moisture-induced debonding would also provide the claimed static shear strengths claimed by the present invention.

The Applicant discovered that certain formulations of slow-crystallizing hot melt adhesives can, indeed, provide the high static shear strengths required for use with fastener applications, and specifically claims the use of slow-crystallizing hot melt adhesives in fastener bonds that provide high static-shear strength. Bunnelle does not contemplate that slow-crystallizing hot melt adhesives (of any formulation) can provide this benefit at any point in his teachings, and it is well understood that the solidified peel strength that he discloses can not be reliably used to correlate with the claimed static shear strength. In addition, as noted before, the difference in bonding requirements for non-load bearing applications (as described in Bunnelle) and for load-bearing bonds (as described by the present invention) are significant. Thus, in specifying an adhesive for load-bearing elements like fasteners, one of ordinary skill in the art would choose an adhesive using an entirely different set of criteria (static shear strength) than those taught in Bunnelle (dynamic peel strength), making reference to

the Bunnelle patent practically useless as a reference to teach how to apply fastener tabs to garments.

Heindel also fails to suggest the slow-crystallizing hot melt adhesive static shear strengths claimed by the present invention. Heindel simply suggests the general use of hot melt adhesives to join fastener materials together, which one of ordinary skill in the art would understand to be limited to those hot melt adhesives that have sufficient strength to resist high-loads. Specifically, the Applicant has determined that the static shear test is the most predictive and useful test to use in determining the appropriateness of a hot melt adhesive for fastener bonding applications. Indeed, the Applicant tested a hot melt adhesive traditionally considered to be strong by those of ordinary skill in the art (that is, one that would be suggested by Heindel), and observed that this strong adhesive did not produce bonds that satisfied the static shear strength requirements. In contrast, the slow-crystallizing adhesive that was used under the same conditions consistently produced bonds that were superior to the traditional strong hot melt adhesive, both in the static shear strength test, and in real-life conditions. Thus, the Applicant is seeking to claim the specific measurable advantage demonstrated by slow crystallizing hot melt adhesives over traditional "strong" hot melt adhesives. Heindel makes no suggestion that slow-crystallizing hot melt adhesives can be formulated to provide such bonds, and therefore fails to anticipate the present invention.


In light of the foregoing arguments, Applicant respectfully submits that Heindel, in light of Bunnelle fails to teach or suggest the claimed invention, and reconsideration and allowance of all of the pending claims is respectfully requested.

CONCLUSION

For at least the reasons outlined above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and allowance of the pending claims are respectfully solicited. Should there be anything further required

to place the application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,
HUNTON & WILLIAMS

By: 

Michael P.F. Phelps
Registration No. 48,654

Dated: October 10, 2002

Attachments:

Appendix A
Appendix B
Appendix C

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APPENDIX A

Marked-up Version Of Specification

As Per 37 C.F.R. § 1.121(b)

Please replace the abstract paragraph with the following paragraph:

--[The present invention relates to] A method for attaching mechanical fasteners to absorbent articles and articles produced by such a method. The method attaches [using] slow-crystallizing hot melt adhesives under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about [50 min/kg]60 min/1.2kg. Preferred mechanical fasteners include hook-type fastener tabs. The present invention provides an efficient, reliable method for attaching mechanical fasteners to absorbent articles, [which is superior to previous techniques. The present invention also relates to absorbent articles produced by the described method.]--

Please replace the paragraph at page 1, lines 5-6 with the following paragraph:

--This application claims the benefit of[priority to] U.S. Provisional Patent Application Serial No. 60/159,562, filed October 15, 1999, which is incorporated herein by reference.--

Please replace the paragraph at page 1, lines 13-19 with the following paragraph:

--The use of mechanical fastening means on absorbent articles, such as diapers, training pants, adult incontinent products, feminine care products, and the like, is[are] well known. A common type of mechanical fastener employed on absorbent articles is a hook-and-loop type fastener in which a hook or hook-type fastener tab is provided which is adapted for releasably engaging with a loop or loop-like material. Such hook-and-loop type fasteners are also well known in the prior art. Other well known types of mechanical fasteners include snaps, buttons, zippers, mushroom fasteners and the like.-

Please replace the paragraph at page 2, lines 4-9 with the following paragraph:

-- The present invention overcomes the aforementioned difficulty by supplying an effective and reliable method for attaching mechanical fasteners to absorbent articles using slow-crystallizing hot melt adhesives under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about [50 min/kg]60 min/1.2kg. More particularly, the present invention relates to a method for attaching a hook-type fastener tab to an absorbent article using a slow-crystallizing hot melt adhesive and the resulting absorbent article.--

Please replace the paragraph at page 2, lines 16-19 with the following paragraph:

- d) attaching said mechanical fastener to said absorbent article in the target area with said slow-crystallizing hot melt adhesive under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about [50 min/kg] 60 min/1.2kg. --

~~Please~~ Please replace the paragraph at page 3, lines 6-10 with the following paragraph:

- d) at least one mechanical fastener positioned so as to secure the absorbent article to an intended user, wherein the mechanical fastener is attached to said absorbent article using a slow-crystallizing hot melt adhesive under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about [50 min/kg] 60 min/1.2kg. --

Please replace the paragraph at page 7, lines 7-14 with the following paragraph:

--The topsheet 24 of the disposable diaper 20, as representatively illustrated in FIGS. 1-2, suitably presents a body-facing surface which is compliant, soft feeling and non-irritating to the wearer's skin. Further, the topsheet 24 is preferably less hydrophilic than the absorbent core 26, to present a relatively dry surface to the wearer,

and may be sufficiently porous to be liquid permeable, permitting liquid to readily penetrate through its thickness. If the topsheet is formed from a substantially hydrophobic material, [and] then the hydrophobic material may, optionally, be treated with a surfactant or otherwise processed to impart a desired level of wettability and hydrophilicity.--

Please replace the paragraph at page 10, line 21 - page 11, line 2 with the following paragraph:

--The elastomer substrate 40 can be formed from any known elastic material, such as: elastomer films, e.g., natural or synthetic rubber; elastomer strands, e.g., LYCRA TM [Lycra.TM.] strands; elastomer foams, e.g., urethane foams; elastomer nonwoven materials; laminates or composites of such elastomer materials with other elastomer or non-elastomer materials; and the like. Likewise, the film substrate 46 can be formed from any suitable material known in the art.--

Please replace the paragraph at page 11, lines 8-16 with the following paragraph:

--This test measures the static shear strength of a mechanical fastener/absorbent article bond. The test utilizes a static load at an elevated temperature to simulate extended wear conditions. The test is considered an accelerated test, because the test load and temperatures are intentionally high to reduce the test time. The particular mechanical fastener tested in the present example included a hook-type fastener tab attached to a film substrate, which is in turn attached to an elastomer substrate which is in turn attached to backsheet material. The control samples utilized a traditional hot melt adhesive to secure the component pieces together. The test samples utilized a slow-crystallizing hot melt adhesive according to the present invention to secure the component pieces together.--

APPENDIX B

Marked-up Version Of Claims

As Per 37 C.F.R. § 1.121(c)

Claims 1, 2 and 8 have been rewritten as follows:

1. (Amended) A method for attaching a mechanical fastener to an absorbent article comprising the steps of:
 - a) providing said absorbent article;
 - b) providing said mechanical fastener;
 - c) applying a slow-crystallizing hot melt adhesive to said absorbent article in a target area; and
 - d) attaching said mechanical fastener to said absorbent article in the target area with said slow-crystallizing hot melt adhesive under conditions sufficient to result in a mechanical fastener/absorbent article bond static shear strength of at least about [50 min/kg] 60 min/1.2kg.
2. (Amended) The method according to claim 1 wherein said mechanical fastener/absorbent article bond static shear strength is at least about [200 min/kg] 240 min/1.2 kg.
8. (Amended) An absorbent article comprising:
 - a) a liquid pervious topsheet;
 - b) a liquid impervious backsheet joined to said topsheet;
 - c) an absorbent core positioned between said topsheet and said backsheet; and
 - d) at least one mechanical fastener positioned so as to secure the absorbent article to an intended user, wherein the mechanical fastener is attached to said absorbent article using a slow-crystallizing hot melt adhesive under

conditions sufficient to result in a mechanical fastener/absorbent article
bond static shear strength of at least about [50 min/kg] 60 min/1.2kg.

PATENT

Serial Number: 09/685,610

Attorney Docket No. 53394.000444

APPENDIX C

New Figure 2

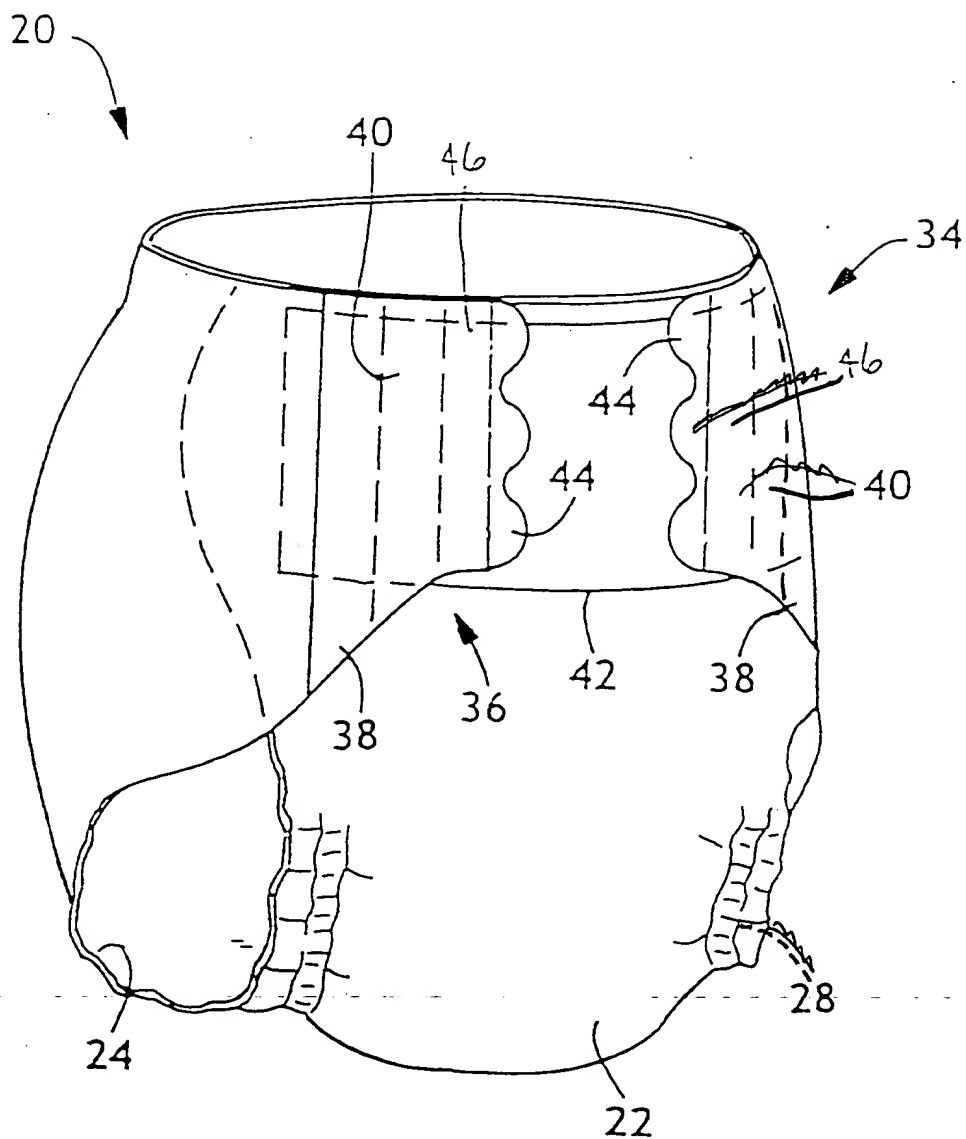


FIG. 2